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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/727,764	12/04/2000	Mun-churl Kim	Q62074	5478
7590 03/23/2004 SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC 2100 PENNSYLVANIA AVENUE, N.W. WASHINGTON, DC 20037-3213			EXAMINER BAYAT, ALI	
			ART UNIT 2625	PAPER NUMBER

DATE MAILED: 03/23/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/727,764

Applicant(s)

KIM ET AL.

Examiner

Ali Bayat

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 23-94 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 23-26, 28-32, 34-38, 40-47, 49-53, 55-59, 61-69, 71-77, 79-85 and 87-94 is/are rejected.
- 7) ☒ Claim(s) 27, 33, 39, 48, 54, 60, 70, 78 and 86 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Continuation of Disposition of Claims: Claims rejected are 23-26,28,29,32,34,35,38,40,41,44-47,49,50,53,55,56,59,61,62,65
69,71,72,75-77,79,80,83-85,87,88 and 91-94.

Continuation of Disposition of Claims: Claims objected to are
27,30,31,33,36,37,39,42,43,48,51,52,54,57,58,60,63,64,70,73,74,78,81,82,86,89 and 90.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 23-64,66-92 and 94 are rejected under the first paragraph of 35 U.S.C. 112.

Images are a 2D spatial representation, not "represented in a time domain" as claimed, for example, "textures" as disclosed by Applicant, describes spatial features, not temporal features.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 23-26,28, 29, 32, 34-35, 38, 40-41, 44-47, 49-50, 53, 55-56, 59, 61-62, 65-69, 71-72, 75-77, 79-80, 83-85, 87-88 and 91-94 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leow et al. (U.S. 6,192,150) in view of Boone et al. (U.S. 5,101,270).

In regard to claim 23, Leow provides for a texture description method using a Gabor filter in a frequency domain for describing texture information of an image, comprising: b) filtering the frequency domain image via Gabor filter having N x M filter regions to produce a filtered image, wherein N and M are predetermined positive

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integers (Fig.2 element 110, col.2 lines 50-59); C) determining texture feature values of the filtered image for respective channels (Fig.2 element 110, col.2 lines 50-59), wherein said channels represent a frequency domain division layout corresponding to the $N \times M$ filter regions of the Gabor filter(Fig.2 element 110, col.2 lines 50-59); and determining an image texture descriptor of the frequency domain image using the texture feature values (col.2 lines 50-59), but Leow does not specifically provide for converting a time domain image represented in a time domain into a frequency domain image represented in a frequency domain. However in the same field of endeavor Boone provides for frequency domain image (col.6 lines 41-44, note 2-D Fourier transform). It would have been obvious to a person of ordinary skill in the art at time the invention was made to incorporate the teaching of Boone (2-D Fourier transform) with the system and method of Leow, because Fourier transform is a frequency transform that decomposes a spatial image into a set of sinusoidal frequency component functions, further the spectral approach filters texture images using a set of filter, and uses the filtered outputs as features for texture classification. Gabor filters are most commonly used for this purpose. Gabor filters can extract frequency and orientation information from the texture images (col.1 lines 42-46 of Boone et al.).

With regard to claims 24,45 and 67, Leow does not expressly provide for two-dimensional Fourier-transformation operation, wherein the frequency domain image is an image of an orthogonal coordinate system frequency domain. However in the same field of endeavor Boone provides for frequency domain image (col.6 lines 41-44, note 2-D Fourier transform). It would have been obvious to a person of ordinary skill in the art

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at time the invention was made to incorporate the teaching of Boone (2-D Fourier transform) with the system and method of Leow, because Fourier transform is a frequency transform that decomposes a spatial image into a set of sinusoidal frequency component functions, further the spectral approach filters texture images using a set of filter, and uses the filtered outputs as features for texture classification. Gabor filters are most commonly used for this purpose. Gabor filters can extract frequency and orientation information from the texture images (col.1 lines 42-46, of Boone et al.).

As to claims 25,46 and 68 Leow provides for filtering the frequency domain image via a Gabor filter (col.2 lines 50-59), but does not provide for converting the time domain image into the frequency domain image via a Radon-transformation operation and a one-dimensional Fourier-transformation operation, wherein the frequency domain image is an image of a polar coordinate system frequency domain. However in the same field of endeavor Boone provides for Radon-transformation operation, a one-dimensional Fourier-transformation operation, and a polar coordinate system (col.6 lines 38-56). It would have been obvious to a person of ordinary skill in the art at time the invention was made to incorporate the teaching of Boone (Radon-transformation operation, a one-dimensional Fourier-transformation operation, and a polar coordinate system), with system and method of Leow, because “ the important consequence of the projection-slice theorem is that by calculating the Radon transform first and then using a 1-D Fourier transform, the computational burden for obtaining the 2-D Fourier transform can be reduced” col.6 lines 45-50 of Boone et al..

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In regard to claims 26,32, 38, 47,53,59,69,77 and 85 Leow provides for a method and computer readable medium, wherein the operation (C) comprises: determining the frequency domain division layout based one of a human visual system (col.4 lines 45-49).

With regard to claims 28,34,40, 49, 55, 61, 71, 79 and 87,Leow provides for a method and computer readable medium, wherein the operation (C2) further comprises: prioritizing channels of the frequency domain division layout (Fig.2 element 110, col. 50-55, also col.1 lines42-45).

As to claims 29, 35, 41, 50, 56, 62, 72, 80 and 88 Leow provides for a method and computer readable medium, wherein the operation (C3) further comprises: calculating at least one of an energy mean value and an energy variance value for the channels of the filtered image; and determining features values for the filtered image based on the at least one of the energy mean value and the energy variance value (Fig.2 element 110 col.3 lines 50-61).

In regard to claims 44 and 94. See claim 23 above. They recite similar limitations as claim 23. Except for computer readable medium (Fig.5 col.5 line 66). Hence they are similarly analyzed and rejected.

With regard to claim 65, Leow provides for inputting a query image (col.3 lines 10-16); determining a query texture descriptor of a query image by using a Gabor filter when the query image is input (Fig.2 element 110, col.3 lines 50-55); determining a distance between the query texture descriptor and a data texture descriptor (col.5 lines 13-23), wherein the data texture descriptor is determined by filtering a data image via a

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Gabor filter (Fig.2 element 110, col.3 lines 50-55); and determining a similarity between the query image and the data image based on the distance between the query image descriptor and the data image descriptor (col.5 lines 13-23).

As to claims 66 see claim 23 above. It recites similar limitations as claim 23. Hence it is similarly analyzed and rejected.

In regard to claims 75,83 and 91 Leow provides for determining the distance between two texture descriptors by comparing the respective feature values corresponding to the respective channels of the filtered image of the query image with respective feature values corresponding to respective channels of a filtered image of the data image (col.5 lines 13-24).

With regard to claims 76, 84 and 92 Leow provides for the distance between the query image and the data image is measured by rotating the query image in a predetermined degree in the frequency domain (col.3 lines 50-59), and the minimum distance is determined as the distance between two images (col.5 lines 13-24).

As to claim 93. See claim 65 above. It recites similar limitations as claim as claim 93. Except for computer readable medium (Fig.5 col.5 line 66). Hence it is similarly analyzed and rejected.

3. Claims 30-31, 36-37, 42-43, 51-52, 57-58, 63-64, 73-74, 81-82 and 89-90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leow et al. (U.S. 6,192,150) in view of Boone et al. (U.S. 5,101,270), and further in view of Shin et al. (U.S. 6,624,821).

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In regard to Claims 30-31, 36-37, 42-43, 51-52, 57-58, 63-64, 73-74, 81-82 and 89-90, Leow provides for the feature extractor 100 identifies, in each image, regions that contain homogeneous texture patterns. Such texture patterns may have varying intensities, scales, and orientations (col.3 lines 28-31), but Leow, as modified by Boone et al. does not expressly provide for determining the image texture descriptor based on a variance of all pixel values of the filtered image. However in the same field of endeavor Shin provides for a variance of all pixel values of the filtered image (col.4 lines 60-67).). It would have been obvious to a person of ordinary skill in the art at time the invention was made to incorporate the teaching of Shin with the system and method of Leow, as modified by Boone. Because for obtaining a predetermined vector by using the calculated mean and variance for retrieving an image texture descriptor for describing texture features of an image (col.4 line60-col.5 line 1).

Allowable Subject Matter

4. Claims 27, 33, 39, 48, 54, 60, 70, 78 and 86 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, first paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Other Cited References

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. patent 6,259,396 to Pham et al. is cited for target acquisition system and Radon transform based method for target Azimuth Aspect Estimation.

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U.S. patent 5,647,058 to Agrawal et al. is cited for method for high-dimensionality indexing in a multi-media database.

U.S. patent 5,949,907 to Raz is cited for window texture extraction for image analysis.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ali Bayat whose telephone number is 703-306-5915.

The examiner can normally be reached on M-Thur 9:00-7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on 703-3085246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ali Bayat *AB*
Patent examiner
Group Art Unit 2625
3/19/04

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